

WING-LENGTH IN SOME NEW ENGLAND ACRIDIDAE.—II.

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Turning to another subfamily, the Acridinae, we find a genus—*Melanoplus*—in which the wing-length is perhaps as good a character as exists for separating the females of certain New England species; *c. gr.*, *M. collinus* from *M. femur-rubrum*, *M. rectus** from *M. minor*.

Yet here, on the other hand, we meet a species, *M. junius* Dodge, presenting great variation in this particular. Some of the females possess wings and tegmina extending but two-thirds down the femora: others show them passing the end of the femur by nearly a fourth of its length. In the males they are somewhat less variable, and longer proportionally. It is to be noted, in connection with the brevity of wings in many specimens, that this species is of a sluggish disposition and progresses largely by leaping.

It is also interesting to observe, in the cases of two abortive-winged species of this subfamily—*Melanoplus rectus*

(= *Pez. borealis*) and *Pezotettix manca*—how the lack of available flight-organs is compensated by the alertness of the insects, an extremely swift movement of the hand being necessary to effect their capture.

Sharply marked off from the other members of the family by characters of much interest here are the little "grouse locusts"—Tettiginae. In these the wing-covers are reduced to minute proportions, while the dorsal part of the pronotum has been correspondingly developed to supply their place as a covering and protection for the delicate wings. The efficiency of the wings as flight organs in those forms in which they are fully developed is unimpaired by the brevity of the tegmina for the reason that the costal border of the wings has become considerably chitinized; when closed this portion also affords some protection on the sides below the pronotal process.

Here, then, is an opportunity to observe if in the case of variation in length of wings there be a corresponding variation not in length of wing-covers, which are here functionless as such, but in the length of that structure which serves the purpose of tegmina—the dorsal part of the pronotum.

Among the eight forms occurring in New England there are three cases in which two are separated merely on this

* From an examination of the limited material (consisting mainly of the types) in the collections of Mr. Scudder and the Museum of Comparative Zoology and the comparison with these of a relatively large series of specimens taken in Mass., together with a few from Speckled Mt., Me., I see no reason to think that *Melanoplus rectus* Scudd. is other than *Pezotettix borealis* Scudd. I use the latter name here for convenience. Mr. Scudder has himself stated the probability that *P. borealis* is *P. septentrionalis* Sauss. I would suggest in this connection that *Melanoplus curtus* Scudd., from 5000 ft. elevation, Colorado, is likely to prove the same species as *M. rectus*.

character of length of pronotum and wings.

Take first the species called *Batrachidea cristata*: here the wings are so small as to be quite functionless and the pronotum merely covers the body, often failing to reach the tip of femora. Compare with it the form described as *B. carinata*: in this the wings are large and amply sufficient for flight and the pronotum correspondingly developed posteriorly to afford them protection when closed. Owing to the high median carina on the anterior portion this backward prolongation of the tip of the pronotum gives an apparently turned-up appearance to its profile. *B. carinata* is found associated with *B. cristata* but is quite rare—but one or two specimens occurring in the hundred, and I have no doubt that this is but another case of reversion and should be so ranked.

Compare the two forms known as *Tettigidea polymorpha* and *T. lateralis*: the one has small wings and abbreviated pronotum, the other large wings and pronotum of ordinary length, noticeably passing the femora. These forms are about equally common and are usually found associated.*

Compare the forms known as *Tettix ornatus* Say and *T. triangularis*

Scudd. Here again, the only apparent difference is in the extent of pronotum and length of wings, structures which in this subfamily are undoubtedly interdependent, as is shown by individuals of other species of this genus, while the characters presented by the vertex and eyes, which offer a safe and ready means of separating these forms from the other New England species, are the same. In view of these facts I believe them to be forms of one species. These, also, are nearly always found associated, the short-winged form being somewhat less common.

While I have not had opportunity to study critically so large a series of specimens as is desirable I feel reasonably certain that the number of species of Tettiginae found in New England should be reduced to five, as follows:

1. *Tettix granulatus* Kirby.
2. *Tettix ornatus* Say and *T. triangularis* Scudd.
3. *Tettix cucullatus* Burm.
4. *Batrachidea cristata* Harris and *B. carinata* Scudd.
5. *Tettigidea lateralis* Say and *T. polymorpha* Burm.

Variation in wing-length seems to be less proportionally in *T. cucullatus* and *T. granulatus* than in *T. ornatus* though it may be very noticeable in specimens of *granulatus* even from the same locality. Such seems to be the case, also, in regard to its constancy in certain species of *Melanoplus* found in New England, as noted above.

While the fact of association of the two forms in the several cases mentioned is no evidence of their identity, it does

* Since the above was written Mr. W. S. Blatchley of Terre Haute, Ind., has informed me by letter that he has taken many pairs of the two forms of *Tettigidea* in copulation and has never seen *lateralis* crossed with *polymorpha*, and in consequence considers them distinct species. It is perhaps best to retain them as such, temporarily, at least. There is a good opportunity here for some thorough, painstaking person to conduct scientific breeding experiments with these interesting little locusts and thereby to add materially to our knowledge of the relationship of the different forms.

not contradict this view of their relation as would the fact of non-association.

In summing up the evidence which I have cited it would seem that: (1) Variations in length of wings are correlated with corresponding variations in length of tegmina or *analogous structures*. (2) In one species of a genus these parts may be quite constant in their proportions to other parts of the body, and in another may vary greatly. (3) Consequently, a difference in length of wing or interdependent structure unaccompanied by a difference in structure of other parts of the body is but more or less doubtful evidence of specific distinctness.

Large series of specimens from a wide range of country are not only desirable but necessary in order to arrive at a correct understanding of the relation of closely allied forms. Personally, I have found that wide acquaintance in the field with the various forms has been of great service.

PROCEEDINGS OF THE CLUB.

13 Oct., 1893. The 180th meeting was held at 156 Brattle St., Mr. S. Henshaw in the chair. Mr. A. P. Morse was chosen Secretary pro tem.

Mr. Lewis E. Hood of Somerville was elected to active membership.

Mr. S. H. Scudder showed some larvae of a Crambid from Plymouth Co., Mass., which injures cranberry vines by girdling the runners and rootlets. He also discussed the identity of some unknown "book-worms" which had caused damage in a library, suggesting the possibility of termites and Lepismidae. Mr. Henshaw suggested that some Ptinid or Tomicus might be concerned.

Mr. A. P. Morse showed a larva of *Lima-codes scapha* found on beech, its color and angular form suggesting the possibility of protective resemblance to a green beech-fruit. He also read a short paper entitled "Notes on the Orthoptera of Penikese and Cuttyhunk Islands."

Messrs. Scudder and Morse expressed the opinion that *Melanoplus punctulatus* Uhler, *Mel. griseus* Thomas, and *Mel. helluo* Scudd. would probably prove to be one species.

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